What is claimed is:

1. A method for automatic correction of motion artifacts in an interlaced video image captured by an image recording camera, comprising:

capturing a complete frame of an interlaced video image, the complete frame having a first raster field and an interlaced second raster field;

automatically correcting for camera motion;

automatically correcting for subject motion; and

displaying an image corrected for camera motion and subject motion.

2. The method of claim 1, wherein automatically correcting for camera motion comprises determining whether the captured frame contains camera motion artifacts.

3. The method of claim 2, wherein automatically correcting for camera motion comprises performing auto-correlation on the first raster field with respect to the second raster field.

4. The method of claim 3, the first and second raster fields each having a plurality of pixels and pixels in the first raster field are offset from pixels in the second raster field, wherein performing auto-correlation comprises creating a two-dimensional motion vector between pixels in the first raster field and pixels in the second raster field.

5. The method of claim 4, wherein creating a two-dimensional motion vector comprises locating optimal correlation values for X/Y coordinates for each pixel in the first raster field relative to a reference pixel in the second raster field.

6. The method of claim 5, wherein locating optimal correlation values comprises using a repeating 3x3 convolution search.

7. The method of claim 6, wherein using a repeating 3x3 convolution search comprises

(a) determining a first correlation value for corresponding pixels in the first and second raster fields when a first specified offset is zero for both X and Y coordinates,

(b) determining a second correlation value for a pixel in the first raster field to the right of the corresponding pixel in the second raster field when a second specified offset is one for X and zero for Y,

(c) calculating a difference between the first correlation value and the second correlation value,

(d) squaring the difference between the values,

(e) repeating steps (a), (b), (c), and (d) for all pixels in the first raster field relative to pixels in the second raster field,

(f) adding the squares of the differences between correlation values at the first specified offset and at the second specified offset, and

(g) determining the correlation values which produce a minimum difference between pixels in the first raster field and the second raster field to provide optimal correlation values for shifting the first raster field relative to the second raster field.

8. The method of claim 4, wherein creating a two-dimensional motion vector comprises locating values for X/Y coordinates for each pixel in the first raster field determined to be offset more than 15 pixels from a reference pixel in the second raster field.

9. The method of claim 3, wherein automatically correcting for camera motion further comprises creating a synthetic first raster field by duplicating the second raster field.

10. The method of claim 4, wherein creating a synthetic first raster field by duplicating the second raster field comprises replacing the first raster field with the duplicated second raster field in the captured complete frame in a corrected position according to the auto-correlation determined by the two-dimensional motion vector.

11. The method of claim 1, wherein automatically correcting for subject motion comprises computing a subject motion map to automatically identify regions of subject motion in the captured frame.

12. The method of claim 11, wherein computing a subject motion map comprises

(a) determining actual pixel values for the first raster field,

(b) computing predicted pixel values for the first raster field from the second raster field,

(c) comparing the predicted pixel values and the actual pixel values for the first raster field to determine differences between the first and second raster fields in discrete regions of the captured frame,

(d) identifying regions of the captured frame where differences between the first and second raster fields are relatively large, and

(e) squaring the relatively large differences between the first and second raster fields to generate the subject motion map.

13. The method of claim 12, wherein computing a subject motion map further comprises convolving the first and second raster fields of the captured frame to produce a half-height grayscale image map in regions of large differences in the subject motion map, and leaving uncorrected regions of the captured frame where differences between the first and second raster fields are relatively small.

14. The method of claim 11, wherein automatically correcting for subject motion further comprises creating a binary subject location map to delineate regions of the captured frame for applying correction for subject motion.

15. The method of claim 14, wherein creating a binary subject location map comprises

(a) establishing a threshold difference between the predicted pixel values and the actual pixel values for the first raster field,

(b) comparing each pixel in the grayscale image map to the threshold difference, counting the number of pixels exceeding the threshold difference,

(c) eliminating from the grayscale image map pixels where three or less neighboring pixels in the grayscale image map are above the threshold difference, and

(d) leaving in the grayscale image map pixels where more than three neighboring pixels are above the threshold difference.

16. The method of claim 15, wherein the threshold difference is in the range from about 20 to about 150 IRE brightness units.

17. The method of claim 15, wherein the threshold difference is 80 IRE brightness units.

18. The method of claim 15, wherein automatically correcting for subject motion further comprises adjusting the binary subject location map by replacing pixels eliminated from the grayscale image map in regions of subject motion.

19. The method of claim 18, the regions of subject motion having pixels eliminated forming boundaries comprising pixels, wherein adjusting the binary subject location map comprises

(a) computing a two-dimensional vector from pixels at the boundaries of eliminated regions of subject motion,

(b) replacing pixels eliminated from regions of subject motion with the two-dimensional vector, and

(c) repeating steps (a) and (b) by computing the two-dimensional vector at locations one pixel further away from the boundaries of the eliminated regions of subject motion to create a corrected image having smooth edges.

20. The method of claim 19, wherein computing a two-dimensional vector from pixels at the boundaries of eliminated regions of subject motion comprises identifying boundaries of eliminated regions of subject motion, and detecting pixels in two directions, one pixel at a time, adjacent to the pixels at the boundaries.

21. The method of claim 19, wherein automatically correcting for subject motion further comprises computing a finished, corrected image.

22. The method of claim 21, wherein computing a finished, corrected image comprises using the adjusted map to indicate regions on the captured frame where subject motion is greatest, and computing a corrected second raster field from a

corrected first raster field in regions on the captured frame where subject motion is greatest.

23. The method of claim 22, further comprising displaying the finished image corrected for camera motion and subject motion.

24. The method of claim 1, further comprising automatically correcting for subject motion after automatically correcting for camera motion.

25. The method of claim 1, wherein capturing the complete frame of the interlaced video image comprises capturing video images taken during surgical procedures.

26. A method for automatic correction of motion artifacts in an interlaced video image captured by an image recording camera, comprising:

capturing a complete frame of an interlaced video image, the complete frame having a first raster field and an interlaced second raster field, the first and second raster fields each having a plurality of pixels;

locating optimal correlation values between pixels in the first raster field and pixels in the second raster field;

creating a two-dimensional motion vector from optimal correlation values;

creating a synthetic first raster field by duplicating the second raster field in the captured complete frame in a corrected position according to the two-dimensional motion vector;

computing a subject motion map to identify regions of the captured frame where differences in pixel values between the first and second raster fields are relatively large;

creating a binary subject location map to delineate regions of the captured frame for applying correction for subject motion;

eliminating from the binary subject location map pixels where the number of neighboring pixels exceeds a pre-determined threshold;

adjusting the binary subject location map by replacing eliminated pixels;

computing a finished, corrected image; and

displaying the image corrected for camera motion and subject motion.

27. A system for automatic correction of motion artifacts in a live, interlaced video image, the system comprising:

an image recording camera for capturing complete frames of video images;

a digital capture unit for processing live video images and captured frames of video images;

a first filter for automatically correcting for camera motion;

a second filter for automatically correcting for subject motion; and

a video monitor for displaying images.

28. The system of claim 27, the complete frames each having a first raster field and an interlaced second raster field, each field comprising a plurality of pixels, wherein the first filter for automatically correcting for camera motion comprises

a two-dimensional motion vector between the first and second raster fields created by auto-correlation, and

a synthetic first raster field created by duplicating the second raster field in a corrected position in the captured complete frame according to the two-dimensional motion vector.

29. The system of claim 28, wherein the second filter for automatically correcting for subject motion comprises

a subject motion map computed to identify regions of subject motion,

a binary subject motion map for eliminating pixels in the regions of subject motion,

an adjusted binary subject motion map, the binary subject motion map adjusted by replacing eliminated pixels, and

a corrected captured frame, the frame corrected by computing a corrected second raster field from the first raster field in regions where subject motion is greatest.

30. The system of claim 27, wherein the video monitor for displaying images comprises images displayed before and after correction for camera motion and for subject motion.

31. The system of claim 27, wherein the system further comprises a freeze mode for freezing live video images and displaying frozen images on the video monitor.

32. The system of claim 31, wherein the system further comprises a capture mode for digitally capturing frozen images by the digital capture unit.

33. The system of claim 32, the digital capture unit having an internal temporary storage capacity, wherein the system further comprises a save mode for saving images corrected for camera motion and subject motion in the internal temporary storage of the digital capture unit.

34. The system of claim 33, the system having a media writer for permanently saving images onto portable storage media, wherein the system further comprises a write mode for permanently saving images corrected for camera motion and subject motion onto portable storage media.